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Medical-Dental Integration for Vulnerable Populations: Addressing Social Determinants and Complex Care Needs – A Narrative Review

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Abstract

Background: Vulnerable populations, including those experiencing homelessness, refugees, and the elderly in long-term care (LTC), suffer disproportionately from poor oral health and its systemic sequelae, exacerbated by fractured care systems and profound social determinants of health (SDOH). The historical schism between medical and dental care creates insurmountable barriers for these groups, leading to preventable suffering, dignity loss, and costly emergency department (ED) utilization for untreated dental pain and infection. **Aim:** This narrative review synthesizes evidence from 2010-2024 on integrated medical-dental care models for vulnerable populations, analyzing the roles of sociology, nursing, dental laboratories, health assistants, pharmacy, and health security in delivering equitable, person-centered care. **Methods:** A comprehensive search of PubMed, Scopus, CINAHL, and sociology databases was conducted. Thematic analysis integrated literature from public health, nursing, dental science, social sciences, and health services research. **Results:** Effective models—such as co-located clinics, embedded dental services in shelters/LTC, and mobile units—demonstrate improved access, better management of chronic diseases (e.g., diabetes), and reduced acute care visits. Success is contingent on addressing sociological barriers (stigma, trust), utilizing health assistants as navigators, incorporating oral health into nursing assessments, providing affordable prosthetics, and ensuring pharmaceutical coordination. **Conclusion:** Medical-dental integration is not merely a clinical convenience but an ethical imperative for health equity. Its realization requires a deliberate, team-based approach that dismantles professional siloes, actively counters structural stigma, and embeds oral health within a holistic framework of social care and crisis preparedness.

Keywords: health equity, integrated care, vulnerable populations, oral health, social determinants of health

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Introduction

Oral health is a fundamental component of overall health, yet it remains one of the most glaring sites of health inequity globally. For vulnerable populations—including individuals experiencing homelessness, refugees and asylum seekers, incarcerated persons, and the frail elderly in long-term care (LTC)—the divide between medical and dental care is not merely an administrative inconvenience but a profound determinant of suffering, social exclusion, and systemic cost (Watt et al., 2019). These groups experience a disproportionate burden of dental caries, advanced periodontal disease, edentulism, and oral cancer, conditions deeply intertwined with social determinants of health (SDOH) such as poverty, trauma, inadequate nutrition, and systemic neglect (Finlayson et al., 2019). The consequences extend far beyond the mouth: untreated oral infections exacerbate diabetes and cardiovascular disease; dental pain impairs nutrition, sleep, and employability; and edentulism undermines speech, self-esteem, and social interaction, constituting a

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profound assault on human dignity (Peres et al., 2019).

The traditional model of siloed, fee-for-service dentistry is fundamentally misaligned with the needs of these populations (Sinnott et al., 2020). Barriers are multifold: financial (lack of insurance, inability to pay out-of-pocket); logistical (lack of transportation, inflexible clinic hours); cognitive/psychological (competing survival needs, mental health comorbidities, prior traumatic healthcare experiences); and systemic (lack of referral pathways, poor health literacy navigation, and the pervasive stigma associated with both poverty and poor oral health (Tsakos et al., 2023). As a result, the emergency department (ED) becomes the default source of care for dental pain, leading to cycles of antibiotic prescriptions and opioid analgesia that fail to address the underlying problem, while incurring exorbitant costs (Owens et al., 2021).

This narrative review synthesizes the evolving evidence (2010-2024) on integrated medical-dental care models designed to overcome these chasms for society's most marginalized. Moving beyond clinical dentistry or general medicine alone, it employs an interdisciplinary lens to analyze the essential contributions of: Sociology (in understanding stigma, social capital, and health-seeking behavior); Nursing (in conducting comprehensive, holistic assessments); Dental Laboratory Technology (in enabling affordable restorative solutions); Health Assistants/Community Health Workers (CHWs) (in acting as cultural navigators and care coordinators); Pharmacy (in managing pain and infection across domains); and Health Security (in ensuring care continuity during crises that disproportionately impact the vulnerable). The central thesis is that achieving health equity for these populations requires a radical re-engineering of care delivery—one that integrates clinical services while simultaneously and deliberately addressing the SDOH that fuel disease. This review will delineate successful models of integration, deconstruct the roles of each discipline within them, and evaluate their impact on holistic health outcomes, patient dignity, and health system sustainability.

The Sociological Foundation

Any attempt to integrate care must first understand the social world of the patient. Sociology provides the critical framework for this, revealing that poor oral health is both a consequence and a symbol of social marginalization.

Stigma and Embodied Inequality

The mouth is a site of intense social judgment. Missing, discolored, or painful teeth are visible markers of poverty, often internalized as personal failure, leading to shame and social withdrawal (Goffman, 2009; Scambler, 2018). This enacted and felt stigma is a powerful deterrent to seeking care, as individuals anticipate disrespectful treatment from providers (Reilly et al., 2022). For refugees, oral health may be de-prioritized amidst trauma and resettlement struggles, while for the elderly in LTC, oral care is often infantilized or neglected, reflecting a broader societal devaluation of aged bodies (Lam et al., 2020).

Social Capital and Navigational Competence

Vulnerable populations frequently lack the social capital—networks, knowledge, and trust—required to navigate complex, bureaucratic healthcare systems (Bourdieu, 2011). Understanding insurance schemes, securing appointments, and completing referrals represent formidable challenges. Integration models must therefore build bridging social capital by employing trusted intermediaries who share lived experience or cultural background with the patient population (Berkowitz et al., 2016).

The Biopsychosocial Model in Action

An integrated approach must therefore move beyond a biomedical disease model to a biopsychosocial one. This means clinical interventions are delivered within a context of trauma-informed care, cultural humility, and active efforts to restore dignity. The success of a dental procedure is measured not only by radiographic success but by whether the patient feels confident to smile in a job interview or eat a meal in public without shame.

Models of Integration: From Co-Location to True Collaboration

Integration exists on a spectrum, from simple co-location to fully integrated, interprofessional teams with shared records and goals (See Table 1 & Figure 1).

Co-Located Service Models

These bring medical and dental services under one physical roof, often in federally qualified health centers (FQHCs), shelters, or school-based clinics. This reduces logistical barriers. For example, a patient seeing a primary care provider for diabetes management can be immediately walked down the hall for a dental screening and cleaning (Christian et al., 2023). While efficient, co-location does not guarantee integrated care without shared care plans and communication.

Embedded Care in Non-Traditional Settings

This involves placing dental services directly within institutions serving vulnerable groups. Examples include portable dental units in homeless shelters, on-site dental suites in LTC facilities, and mobile dental vans that visit refugee resettlement areas (Goode et al., 2019). This model meets patients where they are, literally and figuratively, and is often the first point of contact for individuals completely outside the traditional care system (Beaton et al., 2020).

The Interprofessional Team-Based Model

The most advanced form of integration features a dedicated team with shared patient panels and regular huddles (Mosen et al., 2021). In this

model, a health assistant might identify oral health concerns during a community outreach visit; the nurse completes a structured oral health assessment during a wellness check; the dentist and physician consult on a shared patient's diabetes and periodontitis management; the pharmacist reviews medications for xerostomic effects; and the dental technician fabricates a durable, low-cost denture to restore function (Obeng & Ogamba, 2021). This requires robust health information exchange and a culture of mutual respect.

Table 1: Spectrum of Medical-Dental Integration Models for Vulnerable Populations

Model Type	Key Characteristics	Example Settings	Primary Advantages	Key Challenges
1. Co-Located Services	Medical and dental clinics share a facility; may have separate administrative & EHR systems.	FQHCs, Community Health Centers, Some School-Based Clinics.	Reduces geographic/logistical barrier; facilitates informal consultation.	Risk of remaining in "silos"; may not address underlying social needs.
2. Embedded Care	Dental services brought directly into institutions serving vulnerable groups.	Homeless Shelters, LTC Facilities, Refugee Resettlement Agencies, Correctional Facilities.	Extreme accessibility; builds trust within a familiar environment; reaches the "unreachable."	High operational cost & complexity; requires portable equipment; may be episodic.
3. Interprofessional Team-Based Care	Shared patient panels, regular team huddles, unified care plans, integrated EHR.	Advanced FQHCs, Academic Medical Centers, Integrated Health Systems serving Medicaid populations.	Holistic, person-centered care; addresses medical-dental links proactively; efficient use of resources.	Requires significant culture change, training, and IT infrastructure; complex billing.
4. Virtual Integration & Telehealth	Use of telehealth for consultation, triage, and monitoring between medical & dental providers.	Rural health networks, Tele-dentistry platforms linking shelters to dental hubs.	Extends specialist reach; facilitates consultation; good for triage and follow-up.	Limited for hands-on procedures; requires digital access & literacy; reimbursement barriers.

Figure 1. Spectrum of Medical–Dental Integration Models for Vulnerable Populations

The Roles and Synergies of Interdisciplinary Team

Effective integration is executed by a team whose roles are redefined to bridge the medical-dental divide.

Nursing as the Holistic Assessor and Advocate

Nurses, particularly in primary care, public health, and LTC settings, are uniquely positioned to be oral health sentinels. Incorporating a standardized oral health assessment (inspecting for cavities, redness, bleeding gums, ill-fitting dentures) into the nursing admission or annual wellness visit is a powerful, low-cost intervention (Hoben et al., 2016). Nurses can provide basic education, apply topical fluoride varnish (where scope permits), and serve as the crucial link, advocating for and facilitating dental referrals. In LTC, the nurse's role in supervising daily oral hygiene is a direct determinant of pneumonia risk (Marusiak et al., 2023).

The Role of Health Assistants/Community Health Workers

This role is perhaps the most transformative for engagement. CHWs or health assistants who share lived experience or cultural/linguistic ties with the patient population act as trusted bridges (Garcia et al., 2021). They can conduct outreach, explain the importance of oral health in culturally resonant terms, assist with appointment scheduling and transportation, accompany patients to visits to reduce anxiety, and provide follow-up support for behavior change (e.g., smoking cessation, oral hygiene) (Van

Iseghem et al., 2023). They translate system complexities into actionable steps for the patient.

The Role of Dental Laboratory Technology in Enabling Affordable Restoration and Dignity

The dental laboratory is often the forgotten link in equitable care. For a vulnerable patient, the loss of teeth is catastrophic (Mays & Maguire, 2018). Commercial dentures are prohibitively expensive. Dental technicians working within or for integrated programs can utilize cost-effective materials and streamlined designs to produce functional, aesthetic prosthetics at a fraction of the cost (Tiwari et al., 2023). Furthermore, they can provide crucial services like denture marking for identification in LTC settings and repair broken appliances, preventing long periods of disability (Lin et al., 2022).

The Role of Pharmacy in Managing Cross-Domain Therapeutics and Side-Effects

The pharmacist's role is dual. First, in pain and infection management: coordinating analgesic and antibiotic regimens post-dental procedure, mindful of substance use disorder histories and avoiding inappropriate opioid prescribing (Zhang et al., 2023). Second, in medication review: identifying drugs that cause xerostomia (e.g., antipsychotics, diuretics) which accelerates dental decay, and collaborating with prescribers on mitigation strategies or alternatives. In integrated models, pharmacists can counsel patients on the proper use of medicated rinses in conjunction with their overall medication plan (Bavarian et al., 2023).

The Role of Health Security in Ensuring Continuity in Crisis

Vulnerable populations are the first and worst affected in crises—pandemics, natural disasters, or economic collapse. Health security in this context means proactively planning for the continuity of integrated care (Smith et al., 2023). This includes: maintaining supplies of essential dental materials in emergency stockpiles; pre-identifying alternative treatment sites if a shelter or clinic is closed; ensuring vulnerable patient lists are protected and used for proactive outreach during disasters; and advocating for dental care to be included in emergency Medicaid waivers during public health emergencies (Savoia et al., 2017; Frichembruder et al., 2020). Without such planning, hard-won integration unravels when it is needed most.

Outcomes, Barriers, and the Path Forward

The evidence for integrated models, though still evolving, points to significant benefits. Studies demonstrate: Increased access and utilization of dental services; Improved clinical outcomes for both oral and systemic conditions (e.g., better glycemic control in diabetics receiving periodontal treatment); Reduced inappropriate ED use for dental complaints; and powerful qualitative reports of restored dignity and social function (Wei et al., 2022; Atchison et al., 2018). However, formidable barriers persist (See Table 2). Figure 2 depicts the collaborative roles of physicians, dentists, nurses, health assistants/community health workers, pharmacists, dental laboratory technicians, and health security systems in delivering holistic, person-centered care.

Table 2: Critical Barriers and Enablers for Sustainable Medical-Dental Integration

| Domain	Key Barriers	Essential Enablers & Solutions
Financial & Reimbursement	Fragmented payment systems (Medicaid dental vs. medical); low reimbursement rates for dental services; lack of payment for care coordination/navigation.	**Blended/braided funding** models; **Value-Based Payment (VBP)** arrangements rewarding outcomes (e.g., reduced ED visits); billing for CHW services under Medicaid.
Professional Culture & Education	Deep-seated siloes between medical and dental professions; lack of interprofessional education (IPE); scope of practice limitations for nurses/assistants.	Mandatory **IPE** in health professions curricula; creation of **joint clinical guidelines** (e.g., for diabetes-periodontitis); expanded scopes for nurses to apply fluoride varnish.
Information Technology	Incompatible medical and dental EHRs; inability to share records, referrals, and care plans seamlessly.	Development of **interoperability standards**; integration of dental modules into major medical EHRs; use of **shared care plan platforms**.
Workforce & Training	Shortage of dentists willing to serve Medicaid patients; lack of training for health assistants in oral health navigation.	**Loan repayment programs** for dentists in integrated settings; creation of **certified training pathways** for Oral Health Navigators/CHWs.
Policy & Regulation	State-level variability in Medicaid adult dental benefits; restrictive supervision requirements for dental hygienists.	Advocacy for **universal adult dental benefits** in Medicaid; policy changes to allow **hygienist-led models** in community settings.

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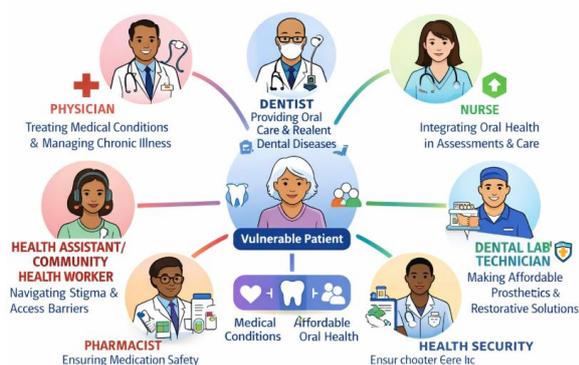
Figure 2. Interdisciplinary Roles in Integrated Medical–Dental Care Addressing Social Determinants of Health

Conclusion

Medical-dental integration for vulnerable populations is more than a service delivery innovation; it is a moral reckoning with a system that has too often accepted profound oral health inequity as inevitable. This review demonstrates that effective integration is a multi-dimensional endeavor. It requires clinical co-location, but also sociological insight to combat stigma. It needs skilled dentists and physicians, but equally depends on health assistants to build trust and dental technicians to restore function affordably. It demands pharmaceutical expertise and security planning to sustain care through adversity.

The path forward is clear, though challenging. It requires advocacy for policy and payment reform that rewards whole-person care. It demands a commitment to interprofessional education that begins dismantling siloes in the classroom. It needs investment in health information technology that connects rather than divides. Ultimately, building integrated systems for the most vulnerable is a test of our collective commitment to health equity. By ensuring that a person's smile is not a marker of their social standing but a testament to their health and dignity, we move closer to a healthcare system that truly leaves no one behind.

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